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Analysis of Soybean Composition Variation and End Use Value Determination in Indiana

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This project focused on (1) the quantification of composition (protein, oil and fiber) and end use value of soybean samples collected as part of the Performance of Public and Private Soybeans in Indiana between 1996-99, and soybean samples collected from selected county plots and farmers' fields in 1998-1999 in Southwest Indiana, and (2) the development of premium schedules for soybean protein and oil content based on regional differences of production in Indiana over multiple years. Preferable soybean varieties for farmers and processors that add value due to their combined higher agronomic and processing yield could not be identified primarily because the top selling varieties were significantly under represented in the four year data set of the Performance of Public and Private Soybeans in Indiana. The sum of protein and oil (P+O) was found to be a useful indicator of processing value. The southeast part of the state had consistently the most valuable soybeans (with respect to P+O) compared to the other four regions. Based on data from farmers' field in Southwest Indiana, an earlier planting date showed a positive correlation on agronomic yield and end use value. Also, yield had 8-35 times greater variability throughout a field compared to composition, thus samples taken from trucks were statistically representative of each field in terms of processing value. A component pricing system for commodity soybeans for five Indiana regions was developed that could be used as a model to pay value added premiums based on composition analysis at the first point of sale. The development of separate protein and oil premium schedules indicated that producers could capture over $2 million in value-added premiums a year if they received 10% of the theoretical added value in soybeans grown in Indiana. Future premiums would serve as an incentive for farmers to select soybean varieties based on agronomic yield and end use value. The delivery of soybeans with more uniformly higher protein and oil contents would also benefit soybean processors by improving their product yields and processing efficiencies.